

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]There is little generation of sludge and this invention relates to the lubricant base oil excellent in conformity with organic materials while it holds a good lubricating oil film in the wide range from an elevated temperature to low temperature and shows the stable viscosity characteristic over the bottom of high shearing, and a long period of time in more detail about lubricant base oil.

[0002]

[Description of the Prior Art]As crankcase oil for gasoline engines, at the time of engine start, etc. has low viscosity, and low temperature requires the lubricating oil of the high viscosity index as correspondence of multigrade **, in order to hold enough oil films for an elevated temperature (at the time of operation). Under the present circumstances, it is coped with by adding a viscosity index improver to the demand of the lubricating oil of such a high viscosity index. However, in the lubricating oil which added the viscosity index improver, Are easy to start a temporary viscosity down, and a viscosity index improver follows on using it, is divided, and a permanent viscosity break down arises, the viscosity-index-improvement effect loses, and also there is a problem of sludging under high shearing by heat deterioration or oxidation degradation. Therefore, in order to solve such a problem, even if it uses it, not using a viscosity index improver, the lubricant base oil of the high viscosity index which there are few additions and ends is needed.

[0003]On the other hand, in a hydraulic system, there are problems, like the oil which the degradation by the increase in viscosity happens in the low-temperature degree portion in piping, and contains a viscosity index improver has slow speed of response from oil with a bad viscosity index. As lubricant base oil known until now, although (1) mineral oil, (2) poly alpha olefin, (3) ethylene-propylene copolymerization thing, (4) polyalkylene glycol, (5) ester, (6) polysiloxanes, etc. can be mentioned, for example, there are the respectively following problems.

[0004]As for (1) mineral oil, a viscosity index a maximum of 140 about and (2) poly alpha olefin at less than pour point-50 ** Namely, about 130 to 140 viscosity index, At less than pour point-30 **, a maximum of 150 about and (3) ethylene-propylene copolymerization thing are pour point-40--50 ** things in the 100 ** viscosity 10 - 20-mm² / second, and a viscosity index is about 150, and there is a problem that compatibility with additive agents, such as a viscosity index improver, is bad. Although there is a problem of swelling organic material although the (4) polyalkylene glycol is about [in viscosity index / 200 to 300] and a viscosity index also has a maximum of 200 about (5) ester, there is a

problem of swelling organic material too. On the other hand, about (6) polysiloxanes, although the viscosity index of silicone oil is as high as 300-400, it has problems, like lubricity is bad, moreover is expensive and there is, for example.

[0005]

[Problem(s) to be Solved by the Invention]The purpose of this invention is as follows.

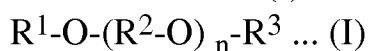
Without using a viscosity index improver, provide a high-viscosity-index oil, and under such a situation, from an elevated temperature to low temperature, hold a good lubricating oil film and the stable viscosity characteristic should be shown over a long period of time under high shearing in the wide range by a little addition.

Provide the lubricant base oil which there is [lubricant base oil] little generation of sludge and is moreover hard to swell organic material.

[0006]

[Means for Solving the Problem]This invention persons found out that that in which carbon / oxygen atom ratio contains ten or more specific compounds might suit the purpose, as a result of repeating research wholeheartedly that lubricant base oil which has the aforementioned desirable character should be developed. This invention is completed based on this knowledge. Namely, this invention, [0007](1)

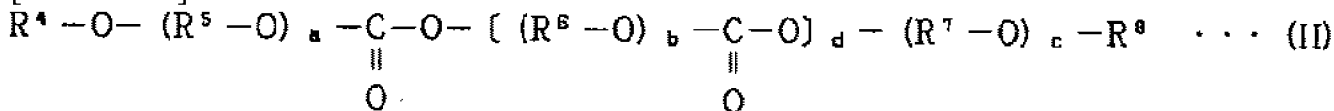
General formula (I)



(R^1 and R^3 independently an alkyl group of the carbon numbers 1-80, an alkyl aryl group of the carbon numbers 7-80, an alkyl carbonyl group of the carbon numbers 2-80, or an alkyl aryl carbonyl group of the carbon numbers 8-80 among a formula, respectively) [show and] R^2 shows an alkylene group of the carbon numbers 2-18, and n shows the number of 0-15 by average value. Even if 16 or more are preferred as for a sum total carbon number of R^1 and R^3 and R^2O is the same for every constitutional unit, It may differ. Lubricant base oil (the lubricant base oil I or the base oil I is called hereafter.), wherein the carbon / oxygen atom ratio expressed contain ten or more compounds, and a viscosity index is 150 or more and the pour point is less than -10 **, and (2) general-formula (II)

[0008]

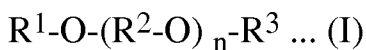
[Formula 2]



[0009](R^4 and R^8 independently the alkyl group of the carbon numbers 1-80, the alkyl aryl group of the carbon numbers 7-80, the alkyl carbonyl group of the carbon numbers 2-80, or the alkyl aryl carbonyl group of the carbon numbers 8-80 among a formula, respectively) [show and] Those sum totals are 0-10, and, as for d , R^5 , R^6 , and R^7 show the number of 0-3 by average value, although the alkylene group of the carbon numbers 2-18 is shown independently, respectively and a , b , and c show the number of 0-5 by average value, respectively. Preferably, the sum total carbon number of R^4 and R^8 is 16 or more, and R^5O , R^6O , and R^7O , In each, for every constitutional unit, it may be the same or may differ. The carbon / oxygen atom ratio expressed contain ten or more compounds, and a viscosity index or more by 150. And lubricant base oil (the lubricant base oil II or the base oil II is called hereafter.), wherein the pour point is less than -10 ** is provided.

[0010]

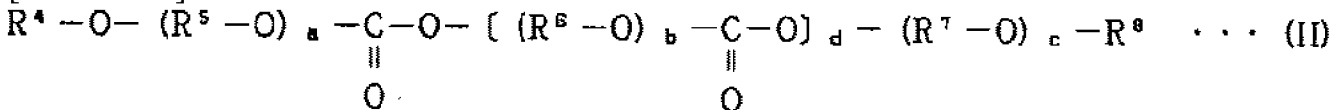
[Embodiment of the Invention]In the lubricant base oil I of this invention, it is general formula (I).



It comes out and ten or more compounds (compound I) are used for the carbon / oxygen atom ratio expressed. It is [in / on the other hand / the lubricant base oil II] general formula (II).

[0011]

[Formula 3]



[0012]It comes out and ten or more compounds (compound II) are used for the carbon / oxygen atom ratio expressed. In the compound expressed with the above-mentioned general formula (I) and (II), since carbon / oxygen atom ratio swells organic material easily by less than ten, In order to control swelling of organic material, the lubricant base oil which must mix hydrocarbon system oils, such as poly alpha olefin, an ethylene-propylene copolymerization thing, and alkylbenzene, so much to the base oil of this invention, for example, and has a high viscosity index as a result becomes is hard to be obtained. Incidentally, the viscosity index of 130-140, and alkylbenzene of the viscosity index of poly alpha olefin is 100 or less. Therefore, as for carbon / oxygen atom ratio, 14 or more are preferred, and 16 especially or more are preferred.

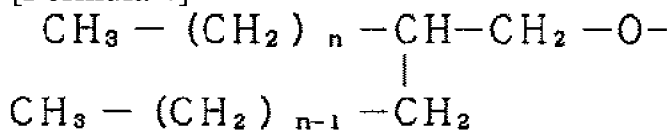
[0013] R^1 in said general formula (I) and R^3 , R^4 in general formula (II), and R^8 , An alkyl group of the carbon numbers 1-80, an alkyl aryl group of the carbon numbers 7-80, an alkyl carbonyl group of the carbon numbers 2-80, or an alkyl aryl carbonyl group of the carbon numbers 8-80 is shown, respectively. When R^1 , R^3 , R^4 , and R^8 are the carbon numbers 0, i.e., a hydrogen atom, lubricity and a viscosity index fall. Since carbon / oxygen atom ratio becomes large and becomes that it is hard to swell organic material so that a carbon number is large, it is desirable, but if a carbon number exceeds 80, acquisition of a raw material will be difficult and the pour point will become high. From a field of balance of lubricity, a viscosity index, carbon / oxygen atom ratio, an ease of acquisition of a raw material, the pour point, etc., ranges of a desirable carbon number of R^1 , R^3 , R^4 , and R^8 are 12-60, and especially its range of 18-50 is preferred.

[0014]Alkyl parts of an alkyl group in this R^1 , R^3 , R^4 , and R^8 and other bases may be straight chain shape and branched state and annular any. Although an alkylphenyl group, an alkyl naphthyl group, etc. are mentioned as an alkyl aryl group, an alkylphenyl group is preferred in these. As an alkyl aryl carbonyl group, although an alkylphenyl carbonyl group, an alkyl naphthyl carbonyl group, etc. are mentioned, an alkylphenyl carbonyl group is preferred in these. In order to make carbon / oxygen atom ratio or more into 16 more preferably 14 or more ten or more, a sum total carbon number of R^1 and R^3 and a sum total carbon number of R^4 and R^8 are 38 or more more preferably 28 or more 16 or more. Desirable things of R^1 , R^3 , R^4 , and R^8 are an alkyl group and an alkyl carbonyl group. In general formula (I), R^1 and R^3 may be mutually the same and may differ from each other. In general formula (II), R^4 and R^8 may be mutually the same and may differ from each other.

[0015]As an example of R^1-O- , R^3-O- , R^4-O- , and R^8-O- , As a thing of the carbon number 8, various octanol residue, such as 2-ethylhexanol residue, Various nonanol residue, various nonanoic acid residue, etc. various octanoic acid residue, such as 2-ethylhexanoic acid residue, etc. as a thing of the carbon

number 10 as a thing of the carbon number 9 Various decanol residue, various decanoic acid residue, etc., As a thing of the carbon number 12, various dodecanol residue, various TODEKAN acid residue, etc., As a thing of the carbon number 14, various tetradecanol residue, various tetradecane acid residue, etc., Various octadecanoic acid residue, such as various OKUDEKA Norian residue, such as isostearyl alcohol residue, and isostearic acid residue, etc. are mentioned as a thing of the carbon number 16 as a thing of the carbon numbers 18, such as various hexadecanol residue and various hexadecanoic acid residue. A following general formula obtained by a Guerbet reaction [0016]

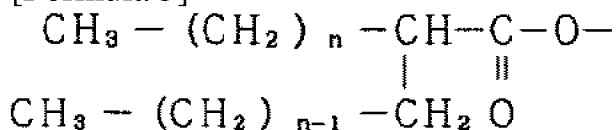
[Formula 4]



(n : 6 ~ 12)

[0017]The following general formula which comes out and is derived from the various alcohol residue of the carbon numbers 16-26 expressed, and these [0018]

[Formula 5]



(n : 6 ~ 12)

[0019]The first class or the second class alcohol residue which comes out and is derived from the various carboxylate residue expressed, alpha olefin, and its polymer, Carboxylate residue, following general formula (R)_m-Ph-OH (among a formula) which are derived from these R shows the alkyl group of the carbon numbers 6-24, Ph shows a phenylene group, and m shows the integer of 1-3. The residue of monoalkyl phenol, dialkyl phenol, or trialkyl phenol etc. which are expressed can be mentioned. R² in said general formula (I), R⁵ in general formula (II), R⁶, and R⁷ show the alkylene group of the carbon numbers 2-18, respectively. What has a with a carbon numbers of 19 or more alkylene group is industrially difficult to receive. This alkylene group may be straight chain shape and branched state and annular any, and ethylene, a propylene group, a butylene group, a hexylene group, a nonylene group, a decylene group, a dodecylene group, a cyclopentylene group, a cyclohexylene group, etc. are mentioned as an example.

[0020]In general formula (I), n shows the number of 0-15 by average value. For every constitutional unit, R²O may be the same or may differ. On the other hand, in general formula (II), although a, b, and c show the number of 0-5 by average value, respectively, those sum totals are 0-10, and d shows the number of 0-3 by average value. R⁵, R⁶, and R⁷ may be mutually the same, and may differ from each other. In each, for every constitutional unit, R⁵O, R⁶O, and R⁷O may be the same, or may differ from each other. moreover[(R⁶-O)_b-COO] When two or more bases are introduced, they may be mutually the same and may differ. A viscosity index is 150 or more, and the pour point of the lubricant base oil I and

II of this invention is as follows [-10 **]. In less than 150, low temperature reaches far and wide from an elevated temperature, a viscosity index cannot hold a good lubricating oil film, and also under high shearing, the stable viscosity characteristic is not obtained over a long period of time, and the purpose of this invention cannot be attained. From a point of performance, as for this viscosity index, 160 or more are preferred, and 165 or more and further 170 especially or more are preferred. When the pour point was higher than -10 ** and internal-combustion engines are presented, there is a possibility of causing poor start up in a cold district etc. the desirable pour point -20 ** or less is -30 ** or less still more preferably. This viscosity index is the value measured based on JIS K2283-1983, and the pour point is the value measured based on JIS K2269-1987.

[0021]In the base oil I and II of this invention, it is preferred that kinetic viscosity with a temperature of 100 ** is in the range of 1.0-50-mm² / second. There is a possibility that lubrication shortage may arise with an oil film piece in less than 1.0-mm² / second in this kinetic viscosity, and if 50-mm² / second is exceeded, a tendency which frictional resistance increases will be seen. From a point that good lubrication performance and abrasion resistance are acquired, desirable kinetic viscosity is the range of 2.0-30-mm² / second, and the range of 2.0-20-mm² / second is especially preferred for it. This kinetic viscosity is the value measured based on JIS K2283-1983. An aniline point's not less than 60 ** is preferred. There is a possibility that this aniline point may swell organic material (rubber) currently used for a device of old lubricant-base-oil correspondence in less than 60 **. If an aniline point is too high, organic material may be shrunk, and a seal leak may be started. Therefore, a range of a desirable aniline point is 60-140 **, and a range of it is 80-130 ** especially preferably 70-140 ** still more preferably. This aniline point is the value measured based on JIS K2256-1985.

[0022]In the lubricant base oil I of this invention, kind content of said compound I may be carried out, and two or more sorts may be contained. In the lubricant base oil II of this invention, kind content of said compound II may be carried out, and two or more sorts may be contained. In such lubricant base oil, other base oil may be suitably contained in the range which may contain both compounds I and II and by which the purpose of this invention is not spoiled. As other base oil, mineral oil, poly alpha olefin, an ethylene-propylene copolymerization thing, ester (monoester, diester, a polyol ester, etc.), polyether (polyalkylene glycol etc.), alkylbenzene, etc. are mentioned, for example. A suitable lubricating oil composition for a various application is obtained by blending suitably an additive agent for lubricating oils by which normal use is carried out, for example, an antioxidant, a rust-proofer, a defoaming agent, a viscosity index improver, pour point depressant, an abrasion proof agent, a demulsifier, a metal cleaner, a detergent additive, an extreme pressure agent, etc. to lubricant base oil of this invention. As a use of this lubricating oil composition, an object for internal-combustion engines is begun, for example, and a use as hydraulic oil, automatic transmission fluid, a manual transmission oil, a buffer oil, gear oil, bearing oil, a sliding-surface oil, refrigerating machine oil, etc. is mentioned.

[0023]

[Example]Next, although the example of manufacture and an example explain this invention still in detail, this invention is not limited at all by these examples. Structure determination of the compound shown in the example of manufacture explained below was performed using the gas chromatograph (it abbreviates to GC below) analysis apparatus, the nuclear-magnetic-resonance-absorption (it abbreviates to NMR below) analysis apparatus, and the infrared-absorption spectrum (it abbreviates to IR below) analysis apparatus. The used device is as follows.

GC analysis apparatus: Hitachi Make 263-70 type (column: GL Sciences, Inc. make OV1 PAKKUDO

column; 2 m)

Nuclear-magnetic-resonance-absorption device: JEOL Co., Ltd. make EX90 (90 MHz), GSX400 (400 MHz)

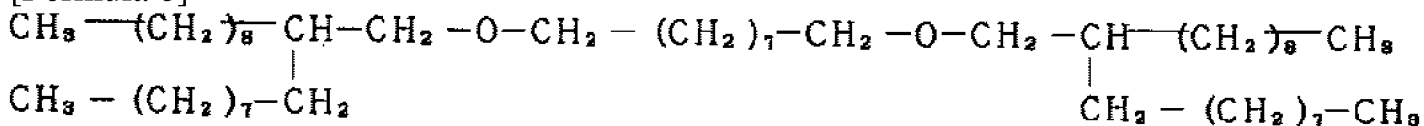
Infrared-absorption analysis apparatus: Jasco Corp. make FT/IR-7000 [0024] 400 g (2.1 mol) of p-tosylchloride and 1500 ml of pyridine were put into 15 l. of example separable flask of manufacture, and it stirred for 5 minutes in the ice water bath. Subsequently, the 1,9-nonanediol 160g (1.0 mol) was put in, and it stirred for 1 hour. On the way, the rise in heat by reaction fever was accepted. The reaction mixture was poured into 3 l. of ice water. It stirred for a while, the ** exception collected the white precipitated crystals, and it dried by decompression. The obtained white solid was heated and dissolved with 500 g of ethanol, and, subsequently it was neglected overnight. The ** exception carried out the depositing white solid, it ranked second, the bottom ethanol of decompression, etc. were distilled off, and the white-crystals thing 250g was obtained. It was checked from NMR analysis and IR analysis that this thing is a 1,9-nonanediol JITOSHI rate.

[0025] The condenser tube, the stirrer, and the dropping funnel were attached to a 5-l. separable flask. 1000 ml of tetrahydrofurans and the sodium hydride 24.0g (1.0 mol) were put in. 250 g (0.85 mol) of 2-nonyl-1-undecanol (Henkel KGaA make: trade name GERUBI toll) was dropped over 1 hour from the dropping funnel. Generating and generation of heat of dropping Shiroshi Nakamizu were accepted. Subsequently, the dimethyl sulfoxide 500g was added and it stirred for 1 hour. The 1,9-nonanediol JITOSHI rate of 187 g (0.40 mol) was applied in 5 steps over 1 hour. Generation of heat was accepted on the way. It stirred then for 2 hours. Reaction mixture was moved to the cleaning tank, 2 l. of hexane was added, and 1 l. of distilled water washed 3 times.

[0026] The light part was distilled off having moved to 2 mouth pear type flask, having heated under vacuum pump decompression further, and pouring a small amount of nitrogen from a glass capillary, after removing a solvent etc. by a rotating evaporator. Subsequently, after silica gel for column chromatography and alumina refined, the solvent etc. were distilled off under decompression by the rotating evaporator, and 180 g of light yellow oily matters were obtained. It was checked that this thing is the following structures by GC analysis, NMR analysis, and IR analysis.

[0027]

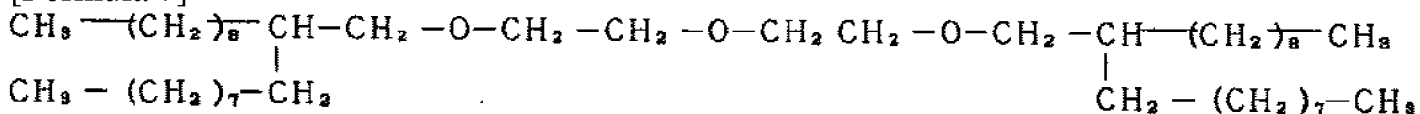
[Formula 6]



[0028] In the example 1 of example of manufacture 2 manufacture, except having used the diethylene glycol instead of 1,9-nonanediol, it carried out like the example 1 of manufacture, and the light yellow oily matter was obtained. As for this thing, it was checked by GC analysis, NMR analysis, and IR analysis that they are the following structures.

[0029]

[Formula 7]

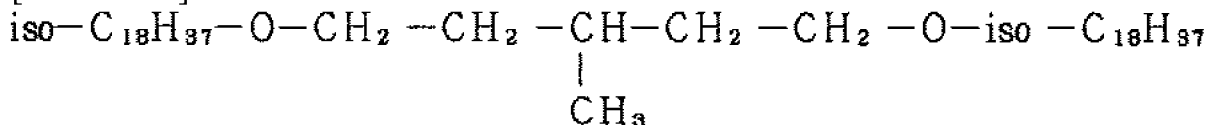


[0030] In the example 1 of example of manufacture 3 manufacture, 3-methyl-1,5-pentanediol is used

instead of 1,9-nonanediol, And except having used isostearyl alcohol (structure, Henkel KGaA make which have one methyl branching in the 2-4th place: trade name emery 3060) instead of 2-nonyl-1-undecanol, it carried out like the example 1 of manufacture, and the light yellow oily matter was obtained. It was checked that this thing is the following structures by GC analysis, NMR analysis, and IR analysis.

[0031]

[Formula 8]

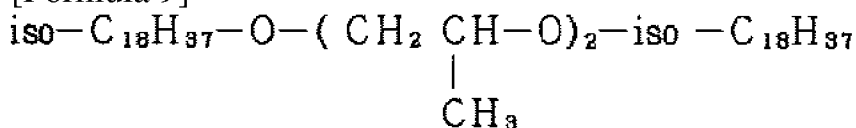


[iso-C₁₈H₃₇: イソステアリル基 (2～4位にメチル分岐を1つ有する)]

[0032]In the example 1 of example of manufacture 4 manufacture, except having used dipropylene glycol instead of 1,9-nonanediol, and having used isostearyl alcohol (the same thing as the example 3 of manufacture) instead of 2-nonyl-1-undecanol, it carried out like the example 1 of manufacture, and the light yellow oily matter was obtained. It was checked that this thing is the following structures by GC analysis, NMR analysis, and IR analysis.

[0033]

[Formula 9]



[iso-C₁₈H₃₇: イソステアリル基 (2～4位にメチル分岐を1つ有する)]

[0034]An example of manufacture 5 Dean SHUTAUKU pipe in attached 2-l. 3 mouth flask 540 g (2.0 mol) of isostearyl alcohol (it is the same as the example 3 of manufacture), 278 g (3.0 mol) of epichlorohydrin, 40 g of sodium hydroxide, and 300 g of hexane are put in, and it was made to react for 10 hours, reaction mixture being 100 ** and refluxing hexane, removing the water generated by a reaction. After a ** exception's carrying out a reaction mixture, it moved to the cleaning tank, 300 more ml of hexane was added, and 300 ml of distilled water washed 3 times. Then, unreacted epichlorohydrin, hexane, etc. were removed by the rotating evaporator, and the liquid object 570g was obtained. The main ingredients were isostearyl alcohol and isostearyl glycidyl ether.

[0035]The condenser tube and the dropping funnel were attached to 2-l. 3 mouth flask, and 38 g (1 mol) of lithium hydride ARUMINIU and 500 ml of tetrahydrofurans were put in in the flask. The aforementioned isostearyl alcohol and an isostearyl glycidyl ether mixture were put into the dropping funnel, and a total of 570g was dropped at it over 2 hours. It stirred after the end of dropping for 1 hour, and subsequently the ethyl acetate 300g was put in, it stirred for 2 hours, and the solution made to dissolve the water 80g in 200 ml of tetrahydrofurans further was added gradually. Since the white solid which uses aluminium hydroxide as the main ingredients generated, the ** exception carried out and this solid was further washed 3 times by 200 ml of tetrahydrofurans. The solution which the ** exception carried out, and the washed solutions were collected, first, after distilling off a tetrahydrofuran etc.,

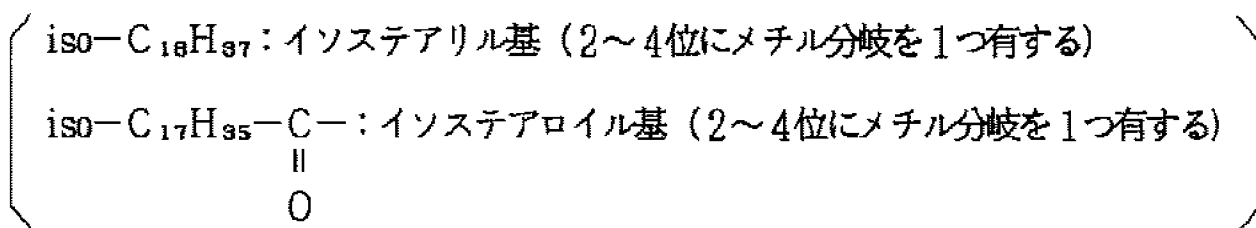
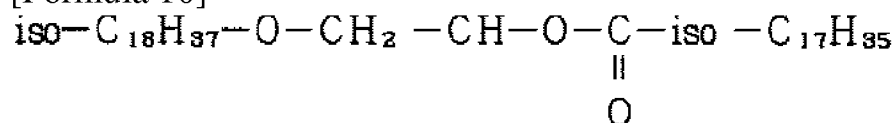
distillation was performed under decompression and the fluid 210g more nearly water-white than isostearyl alcohol as heavy ends was obtained. It was checked that this thing is 2-isostearyl oxy-1-methyl-ethanol of the following structure by GC analysis, NMR analysis, and IR analysis.

iso-C₁₈H₃₇-O-CH₂-CH(CH₃)-OH [0036]The Dean SHUTAUKU pipe in attached 1-l. 3 mouth flask

156 g (0.5 mol) of 2-isostearyl oxy-1-methyl-ethanol, The titanium ethoxy rate of 1.0 g and 100 g of toluene were put in as 156 g (0.55 mol) of isostearic acid (structure which contains one methyl branching in the 2-4th place; made by Uniqema), and a catalyst. Reaction mixture was 140-160 **, and it was made to react except for the water generated while refluxing toluene for 10 hours. Alumina for column chromatography and silica gel removed the catalyst and the unreacted raw material, and 240 g of oily parts were obtained. It was checked that this thing is the following structures by GC analysis, NMR analysis, and IR analysis.

[0037]

[Formula 10]



[0038]209 g (1.1 mol) of p-tosylchloride and 1000 g of pyridine were put into 65 l. of example separable flask of manufacture, and it stirred for 5 minutes in the ice water bath. Subsequently, 298 g (1.0 mol) of 2-nonyl-1-dodecanols were put in, and it stirred for 1 hour. On the way, the rise in heat by reaction fever was accepted. The reaction mixture was poured into the two-layer solution of 2 l. of toluene, and 3 l. of ice water. The after-stirring water layer was removed for 5 minutes. Furthermore, the toluene layer after 3 times washing was moved to the flask with 1 l. of water, and toluene etc. were removed under decompression by the rotating evaporator. 415 g of light yellow oily matters were obtained. This thing was a 2-nonyl-1-dodecanol (unreacted raw material) and 2-nonyl-1-undecanol tosylate.

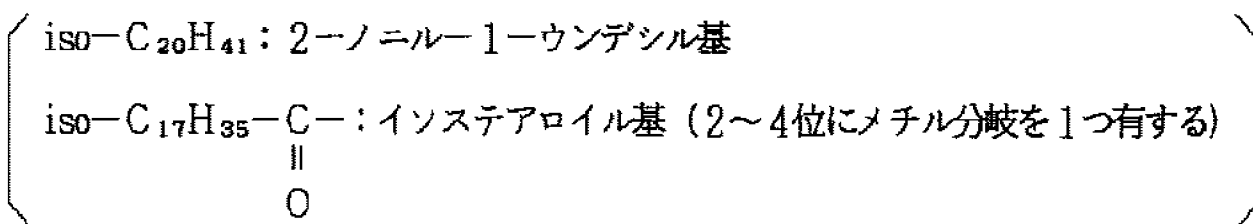
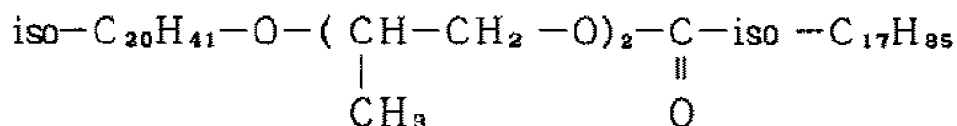
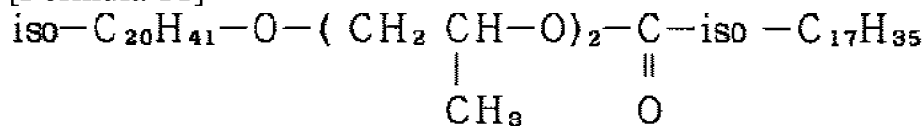
[0039]The condenser tube and the dropping funnel were attached, 24.0 g (1.0 mol) of sodium hydroxide and 100 ml of tetrahydrofurans were put in in the flask, and 354 g (3.0 mol) of dipropylene glycol was dropped at a 5-l. separable flask over 1 hour from the dropping funnel. The solution made to dissolve the mixture 415g of the aforementioned 2-nonyl-1-dodecanol and 2-nonyl-1-undecanol tosylate in a tetrahydrofuran from a dropping funnel was gradually dropped after 1-hour stirring. It heats, and reaction mixture was kept at 60-70 **, and was made to react after the end of dropping for 2 hours. After a ** exception's carrying out a reaction mixture, it moved to the cleaning tank, 1000 ml of hexane was added, and 1000 ml of distilled water washed 3 times. Then, after distilling off hexane, a tetrahydrofuran, etc. by a rotating evaporator, under decompression, it distilled and the light yellow fluid 185g was obtained.

[0040]the fluid 164g (0.4 mol) of this light yellow was put into 1-l. 3 mouth flask furnished with the Dean SHUTAUKU pipe, and the titanium ethoxy rate of 1.0 g and 100 g of toluene were put in as 125 g

(0.44 mol) of isostearic acid (the example 5 of manufacture -- the same), and a catalyst. The inside of reaction mixture was 140-160 **, and it was made to react except for the water generated while refluxing toluene for 10 hours. Alumina for column chromatography and silica gel removed the catalyst and the unreacted raw material, and 225 g of oily matters were obtained. As for this thing, it was checked by GC analysis, NMR analysis, and IR analysis that it is a mixture of the compound of the following two kinds of structures.

[0041]

[Formula 11]



[0042]The carbon / oxygen atom ratio of the compound obtained in the above-mentioned examples 1-6 of manufacture are shown in the 1st table.

[0043]

[Table 1]

第1表

	化合物の炭素／酸素原子比
製造例 1	24.5
製造例 2	14.7
製造例 3	20.5
製造例 4	14.0
製造例 5	13.0
製造例 6	11.0

[0044]The sample offering oil shown in the 2nd table from the compounds obtained in Example 1 - the examples 1-6 of 6 manufactures or these compounds, and other base oil was prepared, and the performance was evaluated. A result is shown in the 3rd table.

[0045]

[Table 2]

第2表

	供試油組成
実施例1	製造例1の油状物 100 wt%
実施例2-1	製造例2の油状物 100 wt%
実施例2-2	製造例2の油状物 70 wt% + 剰α-オレフィン 30wt%
実施例3-1	製造例3の油状物 100 wt%
実施例3-2	製造例3の油状物 90 wt% + エチレン-プロピレン共重合体 10 wt%
実施例4-1	製造例4の油状物 100 wt%
実施例4-2	製造例4の油状物 70 wt% + エチレン-プロピレン共重合体 30 wt%
実施例5	製造例5の油状物 60 wt% + エチレン-プロピレン共重合体 40 wt%
実施例6	製造例6の油状物 50 wt% + エチレン-プロピレン共重合体 50 wt%

[0046](Notes)

poly alpha olefin: -- the product made by ETHYL CORPORATION, trade names "HITEC170", and kinetic viscosity ² of 10 mm / of 100 **, second ethylene-propylene copolymerization thing:kinetic viscosity ² of 20 mm / of the product made from Mitsui Petrochemistry, trade names "roux cant HC20", and 100 ** and second [0047]The sample offering oil shown in the comparative example 1 - the 4 4th table was prepared, and the performance was evaluated. A result is shown in the 4th table.

[0048]

[Table 3]

第3表

実施例	動粘度 ¹⁾ (mm ² /秒)		V I ²⁾	流動点 ³⁾ (℃)	ゴム膨潤 試験 ⁴⁾	アニリン点 ⁵⁾ (℃)
	40℃	100℃				
実施例1	37.2	7.5	174	-35.0	+1	107.4
実施例2-1	26.6	5.6	175	-37.5	-2	68.0
実施例2-2	31.5	6.5	166	-40.0	0	97.1
実施例3-1	35.6	7.3	175	-15.0	-2	77.2
実施例3-2	42.1	8.2	171	-17.5	-1	86.9
実施例4-1	30.4	6.6	180	-15.0	-3	61.9
実施例4-2	51.3	9.4	170	-17.5	0	95.4
実施例5	63.2	10.7	160	-22.5	0	97.0
実施例6	74.7	11.9	155	-55.0	+1	110.9

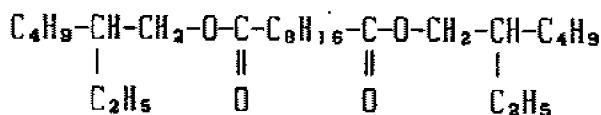
[0049]

[Table 4]

第4表

比較例	構造	C/O	動粘度 ¹⁾ (mm ² /秒)		VI ²⁾	流動点 ³⁾ (℃)	ゴム 膨潤 試験 ⁴⁾	アニリ ン点 (℃)
			40℃	100℃				
1	$\text{C}_4\text{H}_9\text{-O-}(\text{CH}_2\text{CH-O})_n\text{-H}$ $\quad \quad \quad $ $\quad \quad \quad \text{CH}_3$ (n=16)	3.1	56.1	10.8	187	- 50℃ 以下	-15	- 20℃ 以下
2	$\text{C}_4\text{H}_9\text{-O-}(\text{CH}_2\text{CH-O})_n\text{-C-CH}_3$ $\quad \quad \quad \quad \quad \quad $ $\quad \quad \quad \text{CH}_3 \quad \quad \quad \text{O}$ (n=16)	3.0	48.2	9.8	194	- 20℃ 以下	-10	- 20℃ 以下
3	エステル (下記)	6.5	11.6	3.2	153	- 20℃ 以下	-12	- 20℃ 以下
4	3のエステル+PAO		23.3	4.9	140	- 50℃ 以下	- 1	90℃

エステルの構造



[0050]Note 1 kinetic viscosity : Based on JIS K2283-1983, it is based on measurement 4 rubber swelling test:JIS K6301 based on measurement 3 pour-point:JIS K2269-1987 based on measurement 2VI (viscosity index):JIS K2283-1983, Change (grade of swelling) of the hardness of the nitrile rubber 70 hours after 120 ** is measured based on evaluation 5 aniline-point:JIS K2256-1985. [0051]

[Effect of the Invention]The lubricant base oil of this invention can provide a high-viscosity-index oil by a little addition, without using a viscosity index improver. And while holding a good lubricating oil film and showing [from an elevated temperature to low temperature,] the stable viscosity characteristic over a long period of time under high shearing in the wide range, there is little generation of sludge and it has the performance which was excellent in moreover being hard to swell organic material etc.

[Translation done.]